ESIP Usability Cluster
Benchmarking Experiences from the Immune Epitope Database

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Overview

- Background information on the IEDB website
- Benchmarking methods used
  - Online survey
  - User observation sessions
  - User feedback collected at exhibit booths and user workshops (anecdotal/qualitative)
- Current status and future plans

IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE

HOME | QUERY | RESOURCES | ACCOUNT | SUPPORT | ABOUT IEDB |

The Immune Epitope Database and Analysis Resource (IEDB)

Welcome to the Immune Epitope Database and Analysis Resource (IEDB). The IEDB is a project hosted by scientists at the La Jolla Institute for Allergy and Immunology (LIAI), with support from the National Institute of Allergy and Infectious Diseases (NIAID), a part of the National Institutes of Health (NIH), and Department of Health and Human Services (HHS). While not strictly limited, the current focus is presenting information that facilitates the dissemination of immune epitope information, the generation of new research tools, diagnostic techniques, vaccines and therapeutics for emerging and re-emerging diseases.

The IEDB contains data related to antibody and T cell epitopes for humans, non-human primates, rodents, and other animal species. Curation of data relating to NIAID Category A, B, and C priority pathogens (including Influenza) and NIAID Emerging and Re-emerging infectious diseases is complete through June 2007. Curation of Malaria, Hepatitis B, Clostridium tetani, Leishmania, and Candida albicans is current through June 2007. Present efforts include herpesviruses and allergen epitopes. Curation of autoimmune epitopes will start in second quarter 2008.

The database also contains MHC binding data from a variety of different antigenic sources and immune epitope data from the FIMM (Brusic), HLA Ligand (Hildebrand), TopBank (Sette), and MHC binding

:: Summary Metrics (count)

References:	4544
Records:	84693
Distinct Structures:	72235
Distinct Epitopes:	34262

:: Add IEDB Search to your Browser

:: Quick Links

→ Perform a Simple Query
→ Perform an Advanced Query
→ Browse Records by Allele
→ Browse Records by Species
→ Browse Records by 3D Structure
→ Analysis Tools
→ Links
→ Forums
→ Tour the IEDB
→ Register
→ Feedback

:: News / Updates

2006 Annual Workshop Summary

Workshop report on B cell epitope prediction tools

Ab and T cell epitopes of influenza A virus, knowledge and opportunities
Supplemental information

2006 Annual Compendium

A tool developer resource - Benchmarking MHC-I binding predictions

July 2007 IEDB Newsletter

IEDB 1.0

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IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE

Keyword Search | **Search**

| Home | Browse | Advanced Search | Tools | Support | More IEDB |

Search ?

Epitope Structure

- ◉ Any
- ○ **Linear Peptide:** [ ] | Exact Matches ▾
- ○ **Discontinuous Peptide**
- ○ **Non-Peptidic:** [Enter Search] | Molecule Finder | ?

Epitope Source

Source Organism: [Enter Search] | Organism Finder | ?

Source Antigen: [Enter Search] | Molecule Finder | ?

Immune Mediated Disease Association

Disease Name: [Enter Search] | Disease Finder | ?

Experimental New Feature

Immune Recognition Context

- ☑ **B Cell Response**
- ☑ **T Cell Response**
- ☑ **MHC Binding**
- ☑ **MHC Ligand Elution**

Host Organism: [Enter Search] | Organism Finder | ?

MHC Restriction: [Enter Search] | Allele Finder | ?

MHC Class: [▾]

[Search] [Clear]

❖ Help With Common Queries?

Welcome!

i The IEDB contains data related to antibody and T cell epitopes for humans, non-human primates, rodents, and other animal species. Curation of peptidic and non-peptidic epitope data relating to all infectious diseases (including NIAID Category A, B, and C priority pathogens and NIAID Emerging and Re-emerging infectious diseases), allergens, autoimmune diseases, and transplant/alloantigens is current and constantly being updated. More...

Summary Metric	Count
Peptidic Epitopes	105199
Non-Peptidic Epitopes	1947
T Cell Assays	216227
B Cell Assays	163549
MHC Ligand Elution Assays	8608
MHC Binding Assays	248524
Epitope Source Organisms	3062
Restricting MHC Alleles	654
References	15322

See all Metrics

Resources

We have provided a variety of resources to analyze our data and enhance your IEDB experience:

- T Cell Epitope Prediction
- B Cell Epitope Prediction
- Epitope Analysis Tools
- Database Export
- IEDB Ontology
- Data Field Descriptions
- Video Tutorials

News

- ⊞ **New and Noteworthy**
- ⊞ **Publications**
- ⊞ **Upcoming Events**
- ⊞ **Meta-Analyses**
- ⊞ **Compendia**
- ⊞ **Release Notes**

Survey details

- Available on the web via SurveyMonkey
- Data collected over 3 months, after the latest release of the main and tools websites
- Feedback solicited from general users (via a link on the home page), defined user groups, and help desk requesters
- Respondents per website
  - 38 main website
  - 24 tools

Question overview

- Usability metric based on the System Usability Scale (SUS), a simple, 10-item, 5-point Likert scale (0 – 100)
  - Neutral score = 50
  - Another source indicates that 68 is considered average
  - Solid positive score = 75
- System speed assessed on a 10-point scale (1 – 10)
- Scores to serve as benchmarks for future comparisons

System Usability Scale (SUS)

"The System Usability Scale (SUS) provides a 'quick and dirty', reliable tool for measuring the usability.   It consists of a 10 item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree. Originally created by John Brooke in 1986, it allows you to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications." (http://usability.gov)

System Usability Scale (SUS)

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

IEDB Usability Scores

- Scores are fundamentally subjective, based on user impressions
- Main website score
  - 38 respondents
  - Mean = 64 +/- 15
  - Median = 65
- Analysis Resource website score
  - 24 respondents
  - Mean = 68 +/- 12
  - Median = 71

Speed – main website

Main website speed score
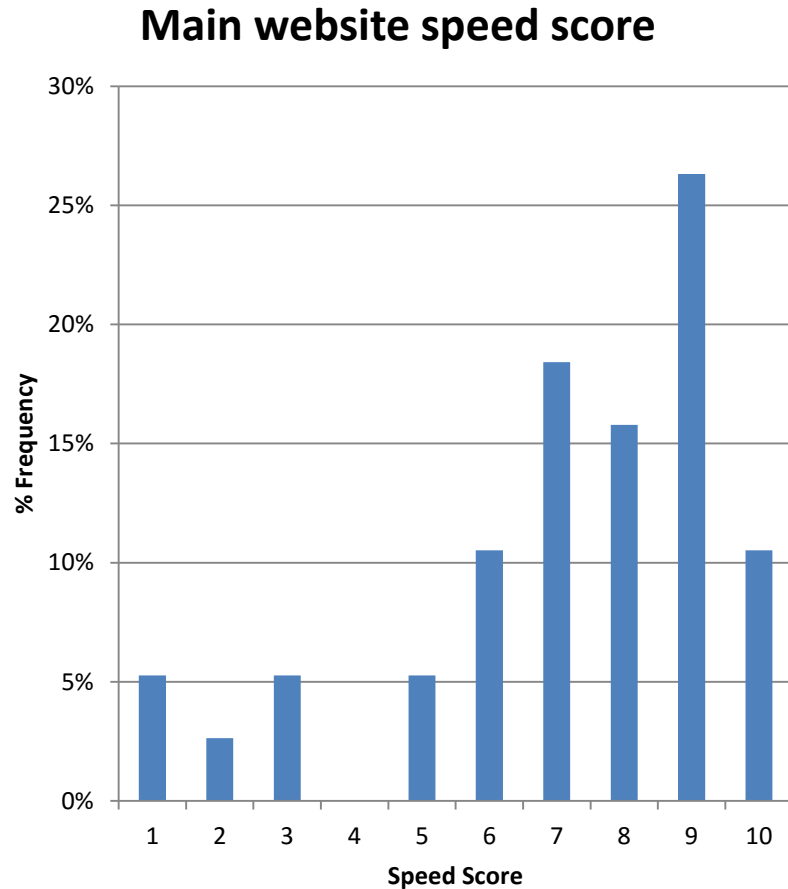
- 38 respondents
- Mean = 7.1 +/- 2.5
- Median = 8
- 16% rated speed less than 6
- Median is acceptable, but still room for improvement

Speed – tools website

Analysis Resource speed score
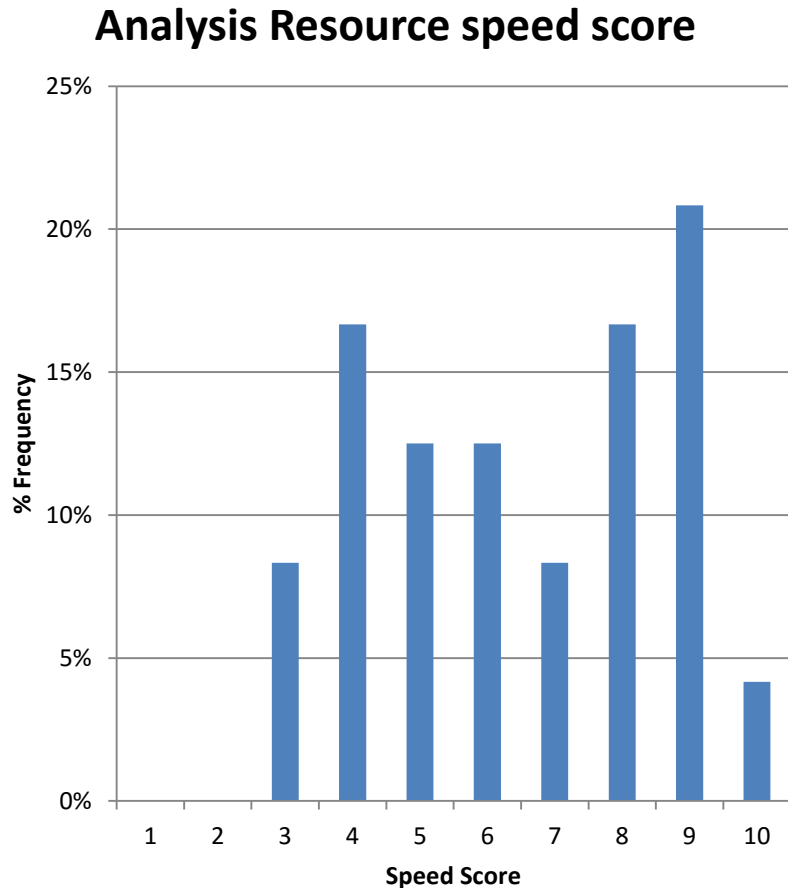
- 24 respondents
- Mean = 6.5 +/- 2.2
- Median = 6.5
- 38% rated speed less than 6
- Definite room for improvement

User Observation Sessions

- Developed 10 sample queries

- Recruited 10 users, including 2 professors, several immunology postdocs, and one bioinformatics postdoc

- Users worked on a laptop connected to a projector so work could be observed and timed by 2 observers

Qualitative benchmarking

- Interaction with users at IEDB exhibit booths
- Feedback gathered at annual user workshops
- Categorization of help desk requests

IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE

Home   Specialized Searches   Analysis Resource

Welcome

The IEDB is a free resource, funded by a contract from the National Institute of Allergy and Infectious Diseases. It offers easy searching of experimental data characterizing antibody and T cell epitopes studied in humans, non-human primates, and other animal species. Epitopes involved in infectious disease, allergy, autoimmunity, and transplant are included.

The IEDB also hosts tools to assist in

Learn More
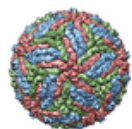
IEDB analysis of the Zika virus available here (analysis updated on an ongoing basis).

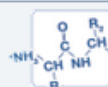The 2016 IEDB User Workshop will be held October 24-25 in San Diego, CA. Info at workshop.iedb.org.

Summary Metrics

Peptidic Epitopes	238,503
Non-Peptidic Epitopes	2,392
T Cell Assays	280,924
B Cell Assays	384,844
MHC Ligand Assays	495,097
Epitope Source Organisms	3,506
Restricting MHC Alleles	735
References	17,750

START YOUR SEARCH HERE ?

Epitope ?

- ◉ Any Epitopes
- ○ Linear Epitope
  - Exact Ma ▾   Ex: SIINFEKL
- ○ Discontinuous Epitopes
- ○ Non-peptidic Epitopes

Antigen ?

Organism

Ex: influenza, peanut

Antigen Name

Ex: core, capsid, myosin

Host ?

- ◉ Any Host
- ○ Humans
- ○ Rodents
- ○ Non-human Primates
- ○ Other Common Hosts ▾

Assay ?

- ☑ Positive Assays Only
- ☑ T Cell Assays
- ☑ B Cell Assays
- ☑ MHC Ligand Assays

MHC Restriction ?

- ◉ Any MHC Restriction
- ○ MHC Class I
- ○ MHC Class II
- ○ MHC Nonclassical

Disease ?

- ◉ Any Disease
- ○ Infectious Disease
- ○ Allergic Disease
- ○ Autoimmune Disease
- ○ Transplant Disease

Reset   Search

Epitope Analysis Resource

T Cell Epitope Prediction ?

Scan an antigen sequence for amino acid patterns indicative of:

- MHC I Binding
- MHC II Binding
- MHC I Processing (Proteasome,TAP)
- MHC I Immunogenicity

B Cell Epitope Prediction ?

Predict linear B cell epitopes using:

- Antigen Sequence Properties

Predict discontinuous B cell epitopes using antigen structure via:

- Solvent-accessibility (Discotope)
- Protrusion (ElliPro)

Epitope Analysis Tools ?

Analyze epitope sets of:

- Population Coverage
- Conservation Across Antigens
- Clusters with Similar Sequences
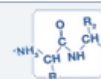- Location in 3D Structure of Antigen

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Pending Filters

Reset | Search

Epitope ?

- Any Epitopes
- Linear Epitope
- Discontinuous Epitopes
- Non-peptidic Epitopes

Antigen ?

Organism

Ex: influenza, peanut

Antigen Name

Ex: core, capsid, myosin

Assay ?

☑ Positive Assays Only

☑ T Cell Assays — Ex: IL-2 release — Finder
☑ B Cell Assays — Ex: ELISA — Finder
☑ MHC Ligand Assays — Ex: purified MHC binding — Finder

MHC Restriction ?

- Any MHC Restriction
- MHC Class I
- MHC Class II
- MHC Nonclassical
- Specific MHC Restriction

Host ?

- Any Host

Current Filters: ✖ Positive Assays Only

Epitopes (240895)	Antigens (27236)	Assays (580520)	References (17640)

Go To Records Starting At **1200** GO | Export Epitopes Results

240895 Records Found | Page 1 of 9636 | 25 Per Page

Details ▼	Epitope ▼	Antigen ▼	Organism ▼	# References ▼	# Assays ▼
123885	cardiolipin			319	1024
44920	NLVPMVATV	65 kDa phosphoprotein	Human herpesvirus 5 (Human cytomegalovirus)	239	602
20354	GILGFVFTL	Matrix protein 1	Influenza A virus	177	425
113645	MEVGWYRSPFSRVVHLYRNGK	Myelin-oligodendrocyte glycoprotein	Mus musculus (mouse)	176	909
58560	SIINFEKL	Gal d 2	Gallus gallus (chicken)	149	366
112741	2,4-dinitrophenyl group			139	475
4602	ASNENMETM	Nucleoprotein	Influenza A virus	134	371
24786	HSLGKWLGHPDKF	Myelin proteolipid protein	Mus musculus (mouse)	111	685
		Envelope glycoprotein	Murine leukemia virus	108	425
		mRNA export factor ICP27 homolog	Human herpesvirus 4 (Epstein Barr virus)	107	232
				107	435
112742	2,4,6-trinitrophenyl group			105	308
6435	CINGVCWTV	Genome polyprotein	Hepatitis C virus	96	264
48237	PKYVKQNTLKLAT	Hemagglutinin	Influenza A virus	94	309
53112	RAHYNIVTF	Protein E7	Alphapapillomavirus 9	90	225
32208	KLVALGINAV	Genome polyprotein	Hepatitis C virus	88	202
61086	SSIEFARL	Envelope glycoprotein B	Human herpesvirus 1	86	285
30001	KAVYNFATC	Pre-glycoprotein polyprotein GP complex	Lymphocytic choriomeningitis mammarenavirus	82	243
7493	DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVVIA	Amyloid beta A4 protein	Homo sapiens (human)	80	244

Future plans

- We expect to retire the legacy website by year's end

- Once retired, we will repeat the SUS survey and compare

- We are working with usability consultants to improve the main website and the Analysis Resource website

- We continue to investigate ways to improve speed